CLAIMS

We claim:

1. A transition insert, comprising:

a first member comprising essentially steel;

a second member comprising Al and between about 1.8% and 10.0% Si; and wherein,

the first member and the second member are joined to one another by one of roll bonding or explosion bonding.

2. The transition insert of claim 1, wherein the second member comprises between about 2.0% and 5.0% Si.

3. The transition insert of claim 1, wherein the second member comprises between about 2.0% and 3.0% Si.

4. The transition insert of claim 1, further comprising:

an interlayer joined to one of the first member or the second member; and wherein,

the first member and the second member are joined to one another at the interlayer by the roll bonding or the explosion bonding.

5. The transition insert of claim 4, wherein the interlayer comprises essentially Cr.

6. The transition insert of claim 4, wherein the interlayer is between about 0.01 and 10.0 microns thick.

7. A transition insert, comprising:

a first member comprising essentially steel;

a second member comprising Al and between about 1.8% and 10.0% Si;

an interlayer comprising essentially Cr joined to one of the first member or the second member; and wherein,

the first member and the second member are joined to one another at the interlayer by one of roll bonding or explosion bonding.

8. The transition insert of claim 7, wherein the second member comprises between about 2.0% and 5.0% Si.

9. The transition insert of claim 7, wherein the second member comprises between about 2.0% and 3.0% Si.

10. The transition insert of claim 7, wherein the interlayer is between about 0.01 and 10.0 microns thick.

11. A transition insert, comprising:

a first member, wherein the first member is a material selected from the group consisting of essentially copper, essentially an iron based alloy, and essentially titanium;

a second member comprising Al and between about 1.8% to 10.0% Si; and wherein,

the first member and the second member are joined to one another by one of roll bonding or explosion bonding.

12. The transition insert of claim 11, wherein the second member comprises between about 2.0% and 5.0% Si.

13. The transition insert of claim 11, wherein the second member comprises between about 2.0% and 3.0% Si.

14. The transition insert of claim 11, further comprising:

an interlayer joined to one of the first member or the second member; and wherein,

the first member and the second member are joined to one another at the interlayer by the roll bonding or the explosion bonding.

15. The transition insert of claim 14, wherein the interlayer comprises essentially Cr.

16. The transition insert of claim 14, wherein the interlayer is between about 0.01 and 10.0 microns thick.

17. A method of joining two dissimilar metals, comprising:

providing a first member comprising essentially steel;

providing a second member comprising Al and between about 1.8% and 10.0% Si; and

bonding the first member and the second member to one another by one of a roll bonding process or an explosion bonding process.

18. The method of claim 17, wherein the second member comprises between about 2.0% and 5.0% Si.

19. The method of claim 17, wherein the second member comprises between about 2.0% and 3.0% Si.

20. The method of claim 17, and further comprising the steps of:

providing an interlayer comprising essentially Cr;

joining the interlayer to one of the first member or the second member; and wherein, the roll bonding or the explosion bonding joins the first member and the second member to one another at the interlayer.

21. The method of claim 20, wherein the interlayer is between about 0.01 and 10.0 microns thick.

22. A transition insert, comprising:

a first member comprising essentially steel;

a second member comprising Al and between about 1.0% and 1.3% Si; and wherein,

the first member and the second member are joined to one another by one of roll bonding or explosion bonding.

23. The transition insert of claim 22, further comprising:

an interlayer joined to one of the first member or the second member; and wherein,

the first member and the second member are joined to one another at the interlayer by the roll bonding or the explosion bonding.

24. The transition insert of claim 23, wherein the interlayer comprises essentially Cr.

25. The transition insert of claim 23, wherein the interlayer is between about 0.01 and 10.0 microns thick.